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CASE REPORT
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Serious Vascular Complications after Nonsurgical Rhinoplasty: A Case Report

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Summary: There has been an increased global demand for dermal filler injections in recent years. Although hyaluronic acid-based dermal fillers generally have a good safety profile, serious vascular complications have been reported. Here we present a typical case of skin necrosis following a nonsurgical rhinoplasty using hyaluronic acid filler. Despite various rescuing managements, unsightly superficial scars were left. It is critical for plastic surgeons and dermatologists to be familiar with the vascular anatomy and the staging of vascular complications. Any patients suspected to experience a vascular complication should receive early management under close monitoring. Meanwhile, the potentially devastating outcome caused by illegal practice calls for stricter regulations and law enforcement. *(Plast Reconstr Surg Glob Open 2016;4:e683; doi: 10.1097/GOX.0000000000000668; Published online 21 April 2016.)*

Nasal dorsum augmentation via dermal filler injections, ie, nonsurgical rhinoplasty, has been reported to result in less trauma and down time.[1] With cross-linked hyaluronic acid (HA) dermal fillers, vascular complications (VCs) have been a concern. Such complications can result from either intravascular injection or the compressive effect of the filler on local vessels. In severe cases, VCs can cause extensive skin necrosis.[2] Here we present a case of serious nasal and frontal skin necrosis.

CLINICAL CASE

In May 2015, a 32-year-old female patient received a nonsugical rhinoplasty, performed by a local therapist, whose license status was unknown. During the procedure, the patient experienced intense pain and the intermediate forehead skin turned pale. After some massage applied to the affected area, the patient was released. The patient experienced persistent tenderness and noticed progressive color alteration of the skin before she presented herself to the hospital 48 hours later.

A thorough physical examination was carried out. A grey-blue color was noticed in the intermediate forehead, bilateral nasal sidewalls, and bilateral soft triangles (Fig. 1). The capillary refill was remarkably slow in the affected area. Considering the HA filler injection history, the VC was diagnosed.

The patient was admitted. A surgical decompression of the tip area was performed. Some excessive foreign material was removed and a suction drainage was placed. Then an emergency hyperbaric oxygen therapy was given, but the improvement of the discoloration was limited. Intensive management including vasodilating therapy, antimicrobial treatment, and supportive treatment followed. Meanwhile, local treatment in the affected area was carried out on a daily basis. Unfortunately, the area of affected skin gradually enlarged and demarcation occurred 1 week later (Fig. 2). After debridement, the wound healed in 1 week, but irregular superficial scars were left (Fig. 3).

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Fig. 1. Forty-eight hours after nonsurgical rhinoplasty with an HA filler, showing the discoloration of the intermediate forehead, bilateral nasal sidewalls, and bilateral soft triangles.

Fig. 2. Six days after HA filler injection, showing the final demarcation of the necrotic tissue. Note the affected area in the forehead corresponds well with the supplying area of the right supratrochlear artery.

The long-term outcome was not satisfying. Superficial scars eventually resulted in unsightly roughness in the affected area. An effect on surrounding structures, such as the profile of eyebrows, was noticed due to the scar contracture. The soft-tissue necrosis in bilateral soft triangles caused angulation and an unnatural appearance of the subunits (Fig. 4).

DISCUSSION

VCs have been the most serious complication after HA filler injections. These complications can be generally divided into 2 categories, resulting from direct intravascular injection or from the compressive effect on local vessels. In this case, the affected area in the forehead corresponded well with the area supplied by the right supratrochlear artery. Considering the diameter of this vessel, a blockage was likely to be caused by a direct intravascular injection when the therapist tried to augment the nasal root and glabella. Blindness has been reported as a consequence after HA fillers were injected into the supratrochlear artery. In our patient, the visual acuity was not impacted, probably due to the needle direction during

Fig. 3. Nine days after HA filler injection, showing the tissue repair process occurring in the affected area.

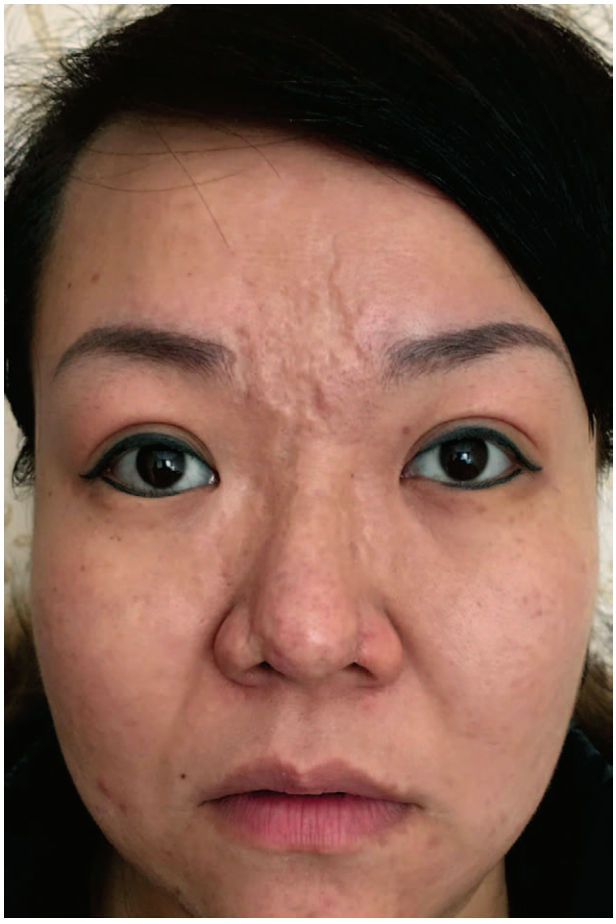

Fig. 4. Eight months after HA filler injection. The superficial scars have resulted in unsightly roughness of the affected area. Angulation in bilateral soft triangles is noticed. The medial end of the right eyebrow was deformed by scar contracture, causing asymmetry of the eyebrows.

the injection, which pushed the emboli to the distal instead of the proximal part of the vessel.[3] On the other hand, due to the small diameters of the vessels in the nasal tip, intravascular injection was less likely. The necrosis of bilateral soft triangles of our patient was considered to be the consequence of an over injection in this area. After the injected HA filler absorbed water from the local tissue fluid, a compressive force was applied on the local vessels to cause occlusion.

Several typical symptoms should set off the alarm bell that the filler has likely been injected into an artery. In the first stage, often immediately after the injection, the patient would experience severe pain in the affected area due to ischemia. Nearly at the same time, the skin becomes pale and the capillary refill is prolonged due to the compromised blood supply. Before the affected area presents a blue to grey-blue color due to local deoxygenated erythrocytes, there would be a transitional period, the livedo phase, when mottled discoloration typically occurs. After persistent ischemia, local skin tissue would necrose and the slough begins. In the final stage, the necrotic tissue would be removed and tissue repair performed.[4]

When the VC is diagnosed, treatments including hyperbaric oxygen therapy,[5] antibiotics, vasodilating therapy, massage, and supportive therapy are usually given, but the outcome is disappointing. Local hyaluronidase injection has been reported to be an effective treatment after intraarterial injection is suspected.[6] However, this enzyme is able to hydrolyse HA in the normal connective tissue, thus causing serious problems by itself. Furthermore, given the HA emboli is likely to be pushed to more distal or proximal part of the vessel, the locally injected hyaluronidase may be difficult to have an effect directly on the emboli. A small scale animal test failed to show the difference when hyaluronidase was applied 24 hours after the injection.[7] Finally, it is noticeable that in some countries, such as China, there are so far no hyaluronidase products with the approval to be applied in VCs caused by HA filler injections.

Although there is no effective therapy, there are several ways to prevent these complications. The most important one is to be familiar with the vascular anatomy.[3] The high-risk zones should be avoided. Second, blunt needles have been shown to cause fewer intravascular injections[8] although they may be less comfortable compared with their sharp counterparts.

With an increasing number of exposed cases of illegal practice, more VCs after HA filler injection have been seen in, but not limited to, China. In different consumer safety guidelines issued by The British Association of Aesthetic Plastic Surgeons (BAAPS)[9] and The American Society for Aesthetic Plastic Surgery (ASAPS),[10] the issue of practitioner qualification was repeatedly emphasized, reflecting the concern of medical organizations about the legitimacy of cosmetic practice. This is a serious situation calling for stricter regulations and law enforcement. The access and use of HA fillers should be strictly limited to authorized healthcare professionals. Otherwise, the patients, and the healthcare system, would eventually pay a heavy price.

CONCLUSIONS

A young woman experienced serious VCs after nonsurgical rhinoplasty using an HA filler. Although various managements were given, remarkable roughness of the affected area and angulation in bilateral soft triangles was eventually experienced. It is critical for surgeons and dermatologists to be familiar with

the vascular anatomy before performing any HA filler injections. Several symptoms and signs, including intense pain immediately after the injection and discoloration of the skin, should be treated as red flags. Any patients suspected to experience a VC should be given early management trying to salvage the skin. Meanwhile, the potentially devastating outcome caused by illegal practice calls for stricter regulations and law enforcement.

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PATIENT CONSENT

The patient provided written consent for the use of her image.

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